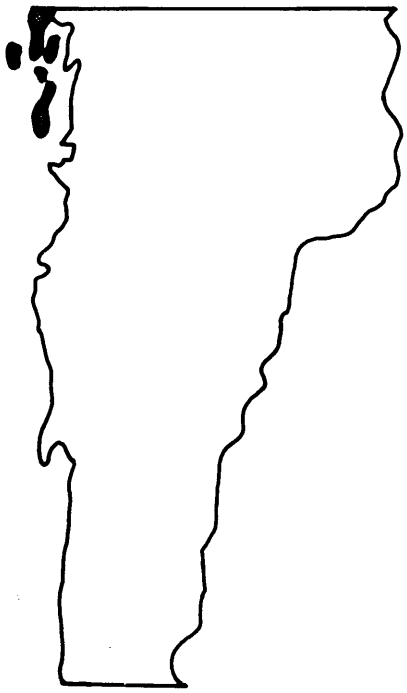
FLOOD INSURANCE STUDY

TOWN OF ISLE LA MOTTE, VERMONT
GRAND ISLE COUNTY



OCTOBER 1979

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION
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TABLE OF CONTENTS

TABLE OF CONTENTS - continued

FLOOD INSURANCE STUDY
TOWN OF ISLE LA MOTTE, VERMONT

1.0 INTRODUCTION

1.1 Scope of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Town of Isle La Motte, Grand Isle County, Vermont, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert the Town of Isle La Motte to the regular program of flood insurance by the Federal Insurance Administration (FIA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these Federally-supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 24 CFR, 1910.1(d). In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the Soil Conservation Service for the Federal Insurance Administration, under Inter-Agency Agreement No. IAA-H-8-77, Project Order No. 13. This study was completed in October 1978.

1.3 Coordination

A public meeting, held on August 16, 1976, in Isle La Motte was attended by representatives of the Soil Conservation Service (SCS--the study contractor), the FIA, and the Town of Isle La Motte. Detailed and approximate study areas were mutually set at this meeting.

Notices to commence field work on the study were printed in the Islander Newspaper on June 7, 14, and 21, 1977.

On August 16, 1977, residents of Isle La Motte showed representatives of the SCS slides of damage caused by water and wave action on April 5, 6, and 7, 1976.

A final public meeting was held on April 26, 1979 to review flood boundaries. Representatives of the FIA, the SCS, and the Town of Isle La Motte attended this meeting.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Isle La Motte, Grand Isle County, Vermont. The area of study is shown on the Vicinity Map (Figure 1).

The north shoreline (the Blanchard Bay area), the west shoreline (Fleury Bay north to Reynolds Point), and the marsh area (Jordan Bay to the west shore) were studied in detail. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction for the next five years, through October 1983.

The south and east shorelines were studied by approximate methods. Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FIA.

2.2 Community Description

The Town of Isle La Motte is totally surrounded by the waters of northern Lake Champlain, located on the western border of Vermont. The island is 5 miles in length and has an area of 16 square miles.

The earliest ferry service for the island was operated in 1796. During the winter, teams of horses crossed the ice to reach the island. Various services were operated until 1936, when a causeway with a draw-toll bridge to Alburg, Vermont was built (Reference 1).

Marble and limestone production has been an important commercial activity since 1844. Quarries are located near the water's edge. Apples have been grown in the area since the late 1800s. There are

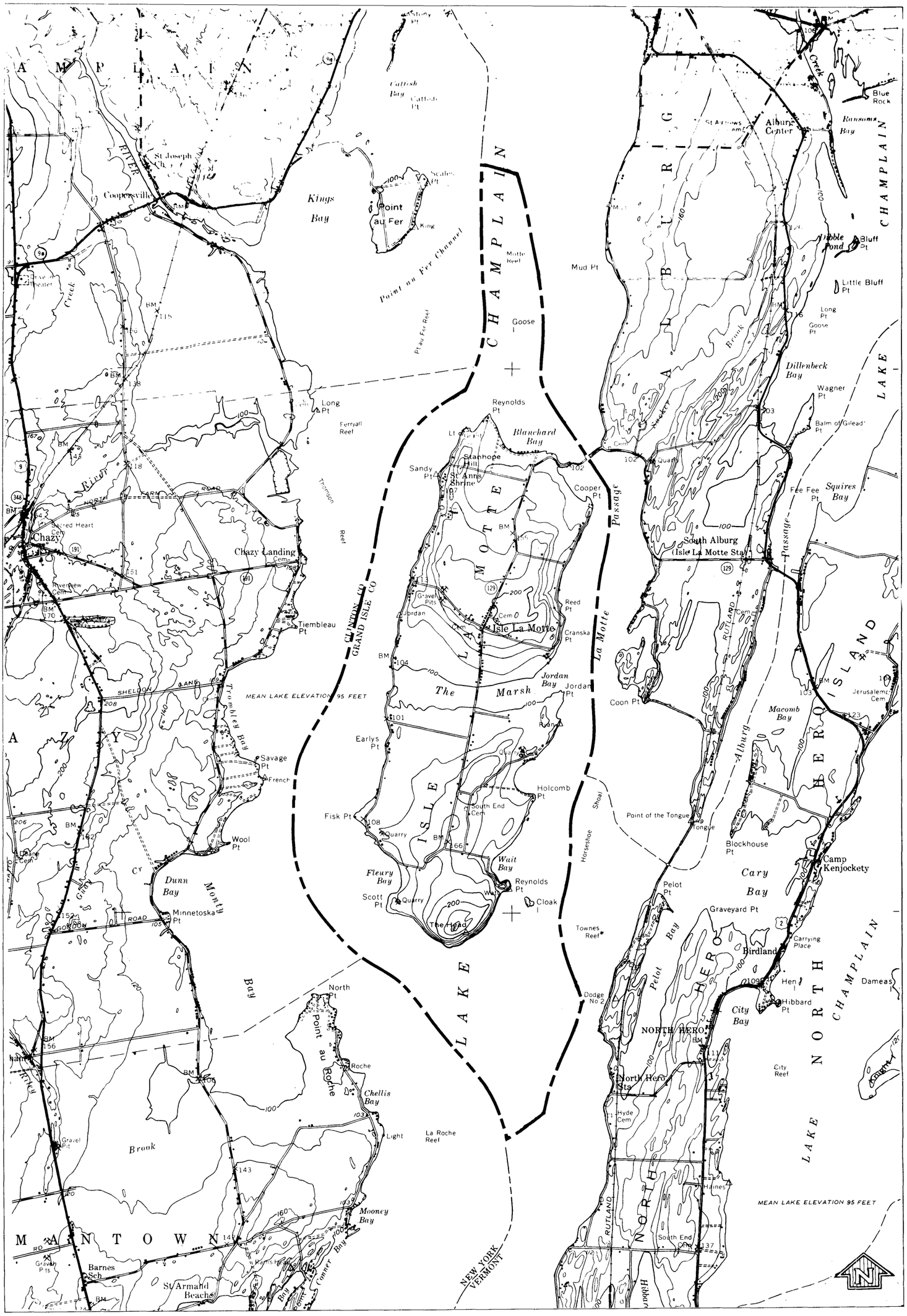

FIGURE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWN OF ISLE LA MOTTE, VT
(GRAND ISLE CO.)

APPROXIMATE SCALE
1 0 1 2 3 MILES

VICINITY MAP

presently two grocery stores, a producing apple orchard, a camping area, three trailer parks, two motels, a few contractors, several dairy farms, and one marble quarry doing business in town. Business activities indicate that the summer population is much larger than the winter population. Many people own homes in the town that they use only seasonally.

There were 47 residents in 1791, 135 in 1800, 300-500 during the years 1830-1910, and a peak of 808 in 1900. In 1970 there were only 262 year-round residents (Reference 1).

Geologically, Isle La Motte was formed 400-500 million years ago by upthrusts of limestone, sandstone, shale, and dolomite. Evidence of ancient sea action can be found in the middle of the island, as well as large boulders from the far north and pools caused by glaciation (Reference 1).

The climate of the entire region affects flooding on the island, since its only flooding source, Lake Champlain, drains an area of 8,250 square miles (Reference 2). Annual averages for the island are: temperature, 45 degrees Fahrenheit; precipitation, 35 inches; snowfall, 65 inches (Reference 3). Precipitation is considerably heavier in the higher elevations of the Lake Champlain basin.

2.3 Principal Flood Problems

Flooding problems develop when a long wet period swells tributaries and raises the level of the lake. This normally occurs in the spring and fall. Northerly and westerly winds cause wave action which has eroded sections of the low-lying shoreline. Areas flooded and subjected to wave action include sections of the north and west shores, West Shore Road, State Aide No. 2 (North and South), Sandy Point, Fisk Point, State Route 129, and the marsh. Camps are flooded and travel on the causeway is impaired nearly every year. The 10-year frequency flood level causes inundation of the marsh and the consequent separation of the island into two parts (Reference 4).

Historical flooding problems date back to the first structures built on Sandy Point. A fort built in 1666 was damaged consistently throughout its existence by waves, ice and high water (Reference 5). Recent flooding damage occurred on April 5, 1976, when the lake rose to 101.7 feet. The recurrence interval of this storm is estimated at 36 years.

2.4 Flood Protection Measures

Structures in the town have been elevated on concrete blocks and concrete pillars. Some riprap is located on the shoreline of the town. There are no plans for future flood protection structures for the Town of Isle La Motte.

3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic study methods were used to determine the flood hazard data for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval), have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten), and for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic and Hydraulic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for floods of the selected recurrence intervals for the flooding source studied in detail affecting the community.

Analyses of elevations of Lake Champlain were adopted from the City of Plattsburgh Flood Insurance Study (Reference 6). Data used in this study were obtained from gaging stations at Rouses Point, New York, and Burlington, Vermont (Reference 6). Flood level frequency relationships are shown in Table 1, "Summary of Elevations."

TABLE 1 - SUMMARY OF ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
LAKE CHAMPLAIN				
At Isle La Motte	101.0	101.8	102.0	102.3

All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the map.

This study reflects still water elevations and does not account for possible wave action or ice damage. Nonetheless, these additional hazards should be considered in planning future development. No hydraulic analyses were done for the Town of Isle La Motte.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for the purpose of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. The 100- and 500-year flood boundaries were delineated using topographic maps at a scale of 1:24,000, with a contour interval of 10 feet (Reference 7). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year boundary has been shown.

Flood boundaries are indicated on the Flood Insurance Rate Map. On this map, the 100-year flood boundary corresponds to the boundary of the areas of special flood hazards (Zone A2), and the 500-year flood boundary corresponds to the boundary of moderate flood hazards (Zone B).

Small areas within the flood boundaries may lie above the flood elevations and, therefore may not be subject to flooding. Owing to limitations of the map scale and/or lack of detailed topographic data, such areas are not shown.

For the shorelines studied by approximate methods, field examination; topographic maps at a scale of 1:24,000, with a contour interval of 10 feet, and engineering judgment were used to produce the boundaries of the 100-year flood (Reference 7).

Flood boundaries are shown on the Flood Hazard Boundary Map for Isle La Motte for several swamp areas and an unnamed tributary to Blanchard Bay (Reference 8). These areas were found to exhibit negligible flood hazards and the boundaries have been revised, based on detailed topographic mapping for this Flood Insurance Study.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for flooding source affecting the Town of Isle La Motte.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses or waterbodies having relatively the same flood hazard. In lacustrine areas, reaches are limited to the distance for which the difference between the 10-year and the 100-year elevation does not vary more than 1.0 foot. Using these criteria, the Isle La Motte shoreline qualifies as one reach whose flooding source is Lake Champlain. The location of this reach is shown on the Flood Insurance Rate Map.

5.2 Flood Hazard Factors

The FHF is the FIA device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the Town of Isle La Motte was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zone A2:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also, areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 2, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding source studied in detail in the Town of Isle La Motte.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Isle La Motte is, for insurance purposes, the principal result of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Lake Champlain Reach 1	10	-1.0	-0.2	+0.3	010	A2	102

[1]Flood Insurance Rate Map Panel
[2]Weighted average
[3]Rounded to the nearest foot - see map

TABLE 2

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

TOWN OF ISLE LA MOTTE, VT
(GRAND ISLE CO.)

FLOOD INSURANCE ZONE DATA

LAKE CHAMPLAIN

accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

Analyses of flood elevations for this study were adopted from the City of Plattsburgh Flood Insurance Study (Reference 6). All elevations in the study are thus in exact agreement with elevations in the previous study.

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Federal Insurance Administration, Regional Director, Region I Office, 15 New Chardon Street, Boston, Massachusetts 02114.

8.0 BIBLIOGRAPHY AND REFERENCES

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